ARIZONA INSECT LOCALITIES.

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"Ariz." on an insect label means nothing; "Sta. Ritas" means but slightly more than nothing.

Since coming here three years ago, I have become more and more aware of this. Eastern collectors in general have little idea of the general and special conditions of this great State. From the high Kaibab Plateau in the North central part of the State and the moisture laden Salt River Valley to the low depression and shifting sands of Yuma, from the arid plains about Tucson to the fir-clad heights of Mount Lemmon, there is a constant variation in vegetation and other ecological conditions. All this affects the insect fauna. Much of what is found in the sheltered, more humid and cooler canyons is absent from the arid plains and uplands. The oaks, spruce and sycamore of the higher canyons are replaced in the plains by Opuntias and many other cacti, creosote bush, mesquite and the many gray-colored desert annuals. Not, of course, that there is any clear-cut line of demarkation—nature is not a layer cake—between the plants and insects of the plains and of the mountains; but that here, as everywhere, there are to be found at times pure cultures of plant and animal associations, mutually interrelated. Needless to say, these statements are not absolute, since many plant and insect forms are practically universally distributed within climatic ranges, while others, as is well known, follow the soil that grows the plant that feeds them.

It follows from these remarks that an Arizona insect locality label is practically valueless without data, at least of altitude, and certainly somewhere there ought to be an indication of the food-plant. But this is about all that can be expected on insects received from the regular commercial collectors. Students of insect biology naturally furnish more data, but not too many miscellaneous insects—they haven't the time to spare. This list of localities is presented to inform collectors distant from this State at least as to the position, altitude and exposure of localities of insects from the older collectors in Arizona; and where possible, to give the general nature of the soil and of the vegetation or the general biotic environment. Places are arranged alphabetically—not geographically—for ready reference. When known, the name of the collector in a particular region or locality is given.

My thanks for the biotic data are given to Professor A. A. Nichol of the Department of Range Ecology of the University of Arizona.

His great experience all over the State in studying plant and animal life makes his contribution authoritative. Place names and locations are derived mostly from Will C. Barnes' work on "Arizona Place Names," published by the University of Arizona. Altitudes and compass directions are from the topographic map of the State put out by the University in conjunction with the U. S. Geological Survey; these altitudes are necessarily not exact to the foot, but approximations arrived at from contour lines.

Arivaipa—A post-office and ranch near San Carlos Lake, in Graham County, in the southeastern part of the State; altitude about 4600 ft.

Baboquivari Mountains—This range extends from the Mexican border north to Quinlan Mountain (sometimes the node in which this peak lies is called Quinlan *Mountains*). It is sometimes called in the older maps "Pozo Verde Mountains" (Green Well Mountains). The range lies on the East side of the Altar Valley, entirely in Pima County, in the south central part of the State. These mountains very sharply divide the Upper from the Lower Sonoran Zone. Most of the early collecting was done on the East side of the range, in the canyons. In the latter, the vegetation is the thorn-bush association—mimosas, mesquite (*Prosopis*), *Alyssum, Celtis* and cacti; the foothills are of the savannah type—grama and curly mesquite grasses.

Baboquivari Peak—The highest elevation rises to 8500 ft., and is situated about the middle of the range. The vegetation is the same as that of the rest of the range.

Bear Canyon—In the southwest slope of the Santa Catalina Mountains. It runs N. E. and S. W., rising from about 3000 ft. at its entrance to 4300 ft. at the top. Characteristic plants are honeysuckle (*Lonicera*) and *Encelia farinosa* (tarweed or resin plant). This is a favorite place for collectors out of Tucson, about 15 miles from that city. Dr. James G. Needham, Dr. E. D. Ball, Dr. L. P. Wehrle, G. P. Engelhardt, Owen Bryant, J. R. de la Torre-Bueno and many others have collected here.

Benson—A town about 48 miles east of Tucson, in the San Pedro Valley, in Cochise County; altitude 4300 feet. Vegetation is of the mesquite-catclaw type, with wild honeysuckle (*Lonicera*).

Bill Williams River—A stream formed by the junction of the Big Sandy and Santa María Rivers, flowing west into the Colorado River. At Planet, some 10 miles from its junction with the Colorado, elevation about 300 feet, it is hot, with wet land vegetation; away from the river the vegetation is of the sparse Colorado-proper

type; mostly *Plantago, Euphorbiae* (spurges), *Poinsettia, Lycium, Atriplex* and other salt bushes; *Parosela* (the smoke-tree) which blooms in June. The rainfall is probably not over three inches per year. Cacti are few—it is too dry.

Bill Williams Fork—This lies about 50 miles up the river from its junction with the Colorado; the elevation ranges from 1300 to 1500 ft. and there is more rainfall. Characteristic vegetation is arrowweed, thornbushes, mesquite, palo verde, Yuccae and other Lilliaceae with not much cactus. Dr. F. H. Snow collected hereabout, on the boundary line between Mohave and Yuma Counties; he gives the elevation as 1000 ft.

Bill Williams Mountain—A peak southwest of the town of Williams, in Coconino County. It rises to 9000 ft. from a high base level at 6000 to 7000 ft. The vegetation is yellow pine, running to aspen, spruce and fir—the Northern Michigan Association.

Bisbee—This mining town lies 6 miles north of the Mexican boundary in the Mule Mountains, at an altitude of 5500 ft. There is much cactus and *Agave* together with the usual grasses of the region; the trees are mainly oak, piñon pine and juniper.

Bradshaw Mountains—A range in Yavapai County, south of Prescott; the altitude runs between 3300 and 6900 ft. H. G. Barber has collected here.

Bright Angel Creek—This stream rises in the Kaibab Plateau, at about 8000 ft. altitude and falls rapidly to the Colorado River, cutting in its descent many life-zones and plant associations.

Bonita—A locality in Post Creek Canyon, in the Graham Mountains, which see. It is in Graham County, 5 miles west of Fort Grant.

Carr Canyon—In the Huachuca Mountains, which see, elevation about 6000 ft. H. G. Barber and Charles Schaeffer collected here.

Casa Grande Ruins—This prehistoric Indian ruin in one of the National Monuments, about 65 miles northwest of Tucson, at an elevation of some 1500 ft., in a flat country of salt bush and creosote bush association. The writer has collected here.

Catalina Mountains—See Santa Catalina Mountains.

Catalina Springs—This is a locality given by H. G. Barber, but not shown on the standard map.

Chiricahua Mountains—This range lies in the southeast corner of Arizona, near the Mexican Border and runs more or less North and South; altitude from 4900 to 7500 ft. This is a favorite hunting ground of Dr. E. D. Ball.

Cochise County—The extreme southeast county of Arizona; the Chiricahua Mountains lie in it. Sundry records from this section came on insects from the late George Franck; the actual collector is so far unknown.

Congress Junction—In Yavapai County, on the Phoenix-Ashfork railway line, altitude some 3000 ft.; also called Martinez. Dr. F. H. Snow collected here.

Continental—In Pima County; a station on a branch line out of Tucson, about 25 miles in a southeasterly direction; turning point for the Santa Rita Mountains. The general growth is cats-claw, mesquite, cactus, etc.; rainfall about 15 inches per annum. This is the site of a rubber-planting scheme, the irrigated areas of which have made some change in the vegetation. The crop now grown here is cotton.

Coyote Mountains—The north end of the Baboquivari Range, with the same general vegetation. Altitudes range from 2300 to 4600 ft. J. R. de la Torre-Bueno has collected there.

Douglas—A mining town in Cochise County, on the Mexican border; altitude 4500 ft. The vegetation is sacaton and grama grasses; the hills roundabout have the usual vegetation of the altitude. This is another of Dr. Snow's collecting grounds.

Fort Grant—This is an H. G. Barber locality, at the western foot of the Pinaleño Mountains (locally termed Graham Mountains), in Graham County; altitude about 4900 feet.

Flagstaff—In Coconino County, in the middle of the northern part of the State; altitude up to 7700 ft.; yellow pine association—bunch grass, Gambel oak, etc.

Florida Canyon—See Santa Rita Mountains.

Graham Mountains—Another name for the Pinaleño Mountains; in Graham County; rise from 4900 ft. to Graham Peak, 10,200 ft. elevation. Low desert to spruce and aspen, according to altitude. Owen Bryant and the writer have collected here.

Galiuro Mountains—In Pinal and Graham Counties; the range runs southeast from Arivaipa Creek to the Graham-Cochise County line; altitude 3000 to 6000 ft. H. G. Barber has collected here.

Globe—In the Pinal Mountains, in Gila County, about 100 miles east of Phoenix. The collecting ground of Owen Bryant, D. K. Duncan and Frank Parker; 3600 feet elevation.

Higley—In Maricopa County, 12 miles southeast of Mesa; altitude 1300 ft. E. G. Holt collected here.

Hot Springs—In Yavapai County; also called Castle Creek Hot Springs; altitude 3000 ft. Collected by Dr. E. A. Schwarz.

Kaibab National Forest—In Coconino County, in the north central part of the State near the Utah border. The general altitude is 7000 ft. Douglas fir, yellow pine, spruce and aspen are the prevailing trees. Dr. E. D. Ball has collected here. The name in the Pi-ute language means "mountain lying down." Included in this area is the Kaibab Plateau.

Mount Lemmon—The highest peak of the Santa Catalina Mountains, rising to a height of 9180 ft. at the summit. It lies in Pima County, on the northeast side of the range. The Douglas fir association is the prevailing type of vegetation. Note the spelling of the name—it has nothing to do with any citrus fruit, since it is the surname of Prof. J. G. Lemmon, who named it in honor of his wife. This collecting ground is frequented by the Tucson entomologists—Dr. E. D. Ball, Owen Bryant, J. R. de la Torre-Bueno and others.

McCleary Peak—In Pima County, in the Santa Rita Mountains; elevation 7000 ft.

McCleary's Camp—In the Santa Rita Range Reserve, in Florida Canyon (once known also as Stone Cabin Canyon), in Pima County. Dr. E. A. Schwarz collected here, as well as elsewhere in the Santa Ritas, which see for biotic details.

Madero Canyon—Also known (more commonly) as White House Canyon, and originally by the Spanish name "Casa Blanca," which means the same; in the Santa Rita Mountains in Santa Cruz County. Elevations range from 4900 to 6600 ft. Collected by Bryant, Ball, Nichol, Parker, Bueno, G. P. Engelhardt. For the prevailing vegetation see Santa Rita Mountains.

Martinez Junction—The same as Congress Junction, which see.

Nogales (Arizona)—The town on the American side of the international boundary, separated by a wire fence from Nogales, Sonora, Mexico. The American town is in Santa Cruz County. The elevation is from 1500 to 4000 ft. in the surrounding hills. The vegetation type is the live-oak—grass savannah. Frequented by many entomologists, as it is the point of entry into Mexico.

Oak Creek Canyon—Dr. F. H. Snow and Mr. G. P. Engelhardt have collected here.

Oracle—A town in Pinal County, on the northern end of the Santa Catalina Mountains. Altitude about 3700 ft. Flora and collectors as for Santa Catalina Mountains, with Dr. H. H. Knight added.

Palmerlee—Cochise County; in the Huachuca Mountains, at about 6500 ft. Dr. F. H. Snow records from here.

Patagonia—In Santa Cruz County; a town on Sonoita Creek, at the northern end of the Patagonia Mountains; about 20 miles northeast of Nogales and less than that from the Mexican border; a section of grassy rolling hills with oaks, and cottonwoods along the creek; altitude amout 3900 ft. Has been collected by the Tucson entomologists—Ball, Bueno and others—and by Dr. H. F. Ruckes and Mr. G. P. Engelhardt.

Phoenix—Capital of the State, in Maricopa County, in the Salt River Valley. This is irrigated farm land and owing to the many canals and ditches, rather humid. The vegetation is altered to the water-needing forms and ordinary farm weeds. The altitude is about 1300 ft. The late Dr. R. E. Kunze collected here commercially, and as he ranged all over the valley, his "Phoenix" locality means anything within 20 miles of that City. The official entomological service of the State centers here.

Picacho Lake (or Reservoir)—In Pinal County, about 45 miles N.W. of Tucson; a large but shallow lake at the northern end of the Picacho Mountains, a storage reservoir in the Casa Grande irrigation system. Rather barren of aquatic forms, however. The surrounding vegetation is the usual wet land association; altitude 1700 ft. Collected by the Tucson people.

Pinacate Range (or lava flow)—This mountain range lies in the extreme southeast corner of Yuma County and runs over into Mexico where it culminates in a high system. The altitude is about 1000 ft. Ball collects here. This is a true Lower Sonoran Zone; the vegetation is sparse—cacti, a few legumes and annuals. The rainfall is very low; the climate consequently dry and hot.

Pinal Mountains—In Gila County, southwest of Globe, which see. Frank Parker and Owen Bryant have collected here. Altitudes range from 5000 to 7850 ft. at Pinal Peak.

Prescott—County seat of Yavapai County; the country roundabout Fort Whipple (just outside of the town) is the piñon pine, juniper, yellow pine association; altitude about 5500 ft.

Quartzsite—Yuma County; elevation 900 ft. The late George Franck had a collector here, name not known to me. Franck's labels read "Quartzsi*d*e." See Yuma for further particulars.

Rincon Mountains—Pima County; lie about 15 miles east of Tucson, rising from the Rincon Valley, elevation 6500 to a height of 8500 ft. at Rincon Peak.

Sabino Canyon—Runs northeast into the Santa Catalina Mountains, which see. Varies from 3400 ft. elevation up. The prevailing vegetation is desert shrubs, Opuntias, etc., with a few Western sycamores along the stream. Everybody collects here at all seasons.

Salt River—See Phoenix.

San Bernardino Ranch—In Cochise County; 18 miles east of Douglas on the Mexican border; elevation 3750 ft. See Douglas for prevailing vegetation. Dr. F. H. Snow and H. G. Barber have collected here at various times.

Santa Catalina Mountains—In Pima County, northeast of Tucson. Typical desert, within an easy ride to the southwest slope, but very roundabout to the northeast. It rises from about 2500 feet at the foothills to the highest peak, Mount Lemmon, which see. Plants in the foothills, white cedar, Douglas fir, oaks, etc., at the higher levels. Everybody collects here.

Santa Rita Mountains—This range lies in Santa Cruz and Pima Counties, northeast of Nogales; elevations range from about 4600 to 9400 ft. at the top of Mount Wrightson, the highest peak. The vegetation is that typical of the other near-by mountains. White House (or Madera) Canyon and Florida Canyon lie in this range. The greater part of the collecting has been done in the canyons by Prof. A. A. Nichol, Dr. E. A. Schwartz (see McCleary's Ranch), Frank Parker, Owen Bryant, G. P. Engelhardt, Dr. E. D. Ball, J. R. de la Torre-Bueno and many others. This is the type locality for numerous new species.

Santa Rita Range Reserve—Fifty thousand acres of grass savannah, mesquite, etc., going into the tree associations in Florida Canyon, which forms part of it; elevation from 3000 to 5500 feet.

Sonoita Creek—See Patagonia.

Summer Haven—A summer resort on the east side of Mount Lemmon, which see; elevation, some 7800 ft.

Tanque Verde Mountains—The south end of the Catalinas, in Pima County, 20 miles east of Tucson; the general altitudes and vegetation the same. All Tucson entomologists and some visitors have collected here.

Tempe—In Maricopa County, 9 miles east of Phoenix, which see.

Tinajas Altas—In Yuma County, close to the Mexican border, in long. 114° W.; altitude 1000 to 1700 feet; Dr. Ball collects here.

Tucson—The City of that name, in Pima County; bench mark altitude 2400 ft., going higher as one mounts the foothills. As a locality, it means practically all the country within 10 miles of the city. The vegetation is typical of the arid country—mesquite, palo verde, creosote bush, cacti and numerous composites. The conditions are quite uniform, except where there is irrigation, where one finds numerous intrusive plants suited to the moisture of the ground. *All* collectors have a Tucson label, and should state the altitude.

Tucson Mountains—In Pima County, some 5 miles west of the city; typical mountain and foothill plants.

Tumacacori Mission—In Santa Cruz County, on the Nogales road. G. P. Engelhardt and J. R. de la Torre-Bueno have collected here.

White House Canyon—The same as Madera Canyon, which see.

Williams—See Bill Williams; W. D. Pierce labels bear this locality.

Wrightson (Mount)—Old Baldy; highest peak of the Santa Ritas, which see.

Yuma—In Yuma County; the town proper is about 200 ft. elevation; but the lowest parts of the surrounding desert are near sea-level. A. E. Morrill collected here; also G. P. Engelhardt. Some of this section is a true desert, with shifting wind-blown sands, no rain and temperatures reaching maxima of over 120° F.

Much could be added to this, many other places and collectors cited. It is very desirable that those who know additional facts should inform the writer, for a supplement to be published later.

Dr. Geza de Horváth.—We learn with deep regret, by a notice from the Hungarian National Museum, of the death of Dr. Horváth at the age of 90 years. He was the last survivor of the great era in hemipterology that gave us Stål, Fieber, Puton, Signoret, our own Uhler and many other eminent workers. Dr. Horváth's work was always remarkable for clarity and grasp of the problem. His death has taken from us one who was easily the greatest of hemipterists in this generation, for in spite of his great age, he was productive of important work to the very last. Entomology has lost in him one of its great men, and the last link with the almost legendary past.—J. R. T.-B.